

# Beyond belief

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# PROPOSITIONS (STELLINGEN)

ACCOMPANYING THE THESIS

## BEYOND BELIEF: ON REASONING IN PSYCHOLOGICAL GAMES

BY

NIELS MOURMANS

1. In epistemic game theory one takes a one-person perspective of a game in order to model the reasoning behind choices, instead of a bird's eye view that can only see outcomes of a game.
2. Beliefs are a crucial part of individual decision-making, both in terms of reasoning towards a choice as well as shaping preferences.
3. In game theory we use the rational player that adheres to solution concepts as a benchmark. This benchmark serves as a solid basis to develop and compare alternative models that try to explain deviations from standard theory.
4. Utilities can directly depend on an entire belief hierarchy in psychological games.
5. In the Surprise Exam Paradox, the correct beliefs assumption is incompatible with the belief-dependent motivation of surprise-seeking.
6. When we extend a traditional game by letting one or more players also have motivations that depend on any higher-order belief, iterative elimination of strictly dominated choices can already fail in characterizing rational choices under common belief in rationality.
7. In psychological games, reasoning about two different rationality-events of expressing  $k$ -fold and  $k'$ -fold belief in rationality may impose conflicting restrictions on the same higher-order belief.
8. The more complex reasoning in line with common belief in rationality becomes, the less one can expect a boundedly rational agent to act in line with such reasoning. As a result, predictions made by practitioners based on such a solution concept can lose accuracy.
9. There is a lot more to find of interest in the wide outside world than inside any single office, room or apartment. Make use of that.
10. "We suffer more often in imagination than we do in reality."

- Lucius Annaeus Seneca